



A Rockwell Automation Company

Enron Transportation and Storage Northern Natural Gas Spearman Unit #3 Compressor Controls

The Client:

Northern Natural Gas was Enron's largest interstate system with approximately 17,000 miles of pipeline. Northern provides transportation and storage services to approximately 70 large utility clients and thousands of end-use customers in the Upper Midwest.

Northern provides cross-haul grid transportation between other interstate and intrastate pipelines in the Permian, Anadarko, Hugoton and Midwest areas.

Northern also operates three natural gas storage facilities and two LNG peaking units.

The Spearman Compressor Station injects gas into the Northern system from the Anadarko basin supply area located in the Texas Panhandle.

The Requirement:

Enron has been operating five (5) Spearman compressors with a single Siemens 555 Unit PLC. The single Unit PLC communicates over Siemens TIWAY to the Station PLC and TISTAR Station HMI. Each individual engine is started and stopped from a local pushbutton panel and monitored remotely. Enron has decided

to fully automate the operation of the compressors so they can be started remotely. Enron chose Spearman Unit #3 as the first engine to be upgraded.

The Design Solution:

The Unit #3 remote I/O rack was replaced with a new Siemens 545 PLC. A new CTC graphic operator interface terminal was installed in the PLC cabinet located at the unit. The purpose of this display is to give the operator information concerning the performance of the unit and aid in maintenance of the unit. The new PLC was programmed with Siemens APT language to provide an automatic start sequence for the compressor, along with PID controls and pocket loading. Communications to the Station PLC and Station

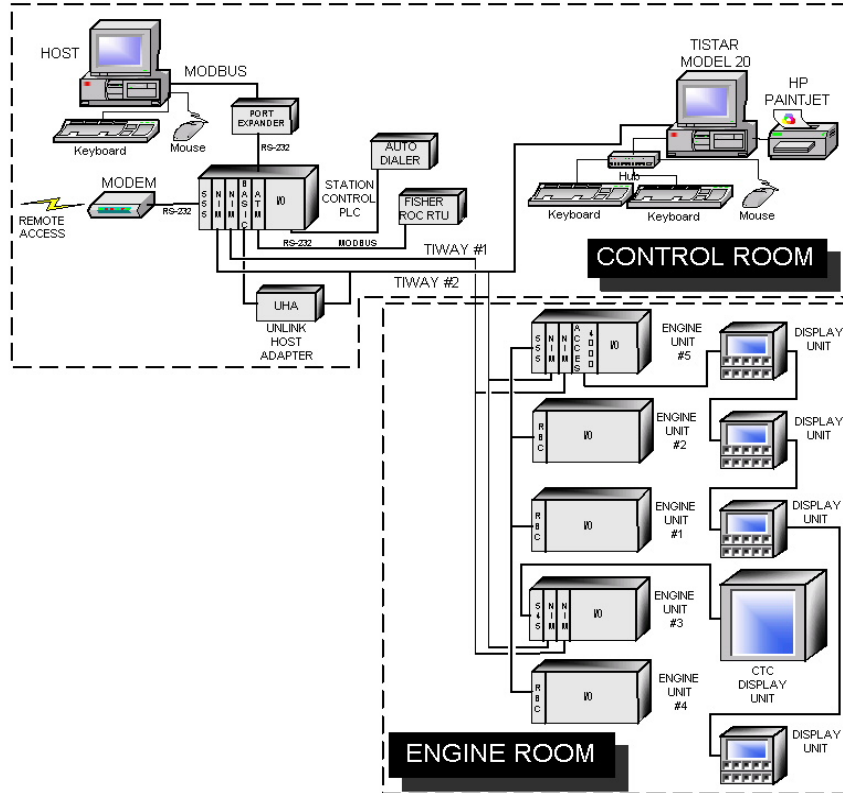
HMI were maintained by updating the TIWAY UniLink Host Adapter communications program.

Hinz provided panel design, installation and commissioning services and also provided a new solenoid panel for pocket loading and eutectic detectors.



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System Specifications:

- Siemens 545 PLC with TIWAY communications
 - 43 Digital Inputs
 - 35 Digital Outputs
 - 52 Analog Inputs
 - 8 Analog Outputs
- CTC Power Station OIT Panel
- Siemens Unlink HOST Adapter Communications Controller
- Fuel Brake, Gas Compressor, Load Brake Horsepower
- Siemens APT Applications Programming Software
 - Speed Control
 - Ignition Timing
 - Fuel Gas Consumption
 - Fuel Brake, Gas Compressor, Load Brake Horsepower
 - Relative Efficiency
 - Rod Load and Torque Control
 - Fuel Flow
 - Unit Start Sequence
 - Air/Fuel Ratio Control

For further information or to contact a Hinz office near you, please check our website at:

www.hinz.com